

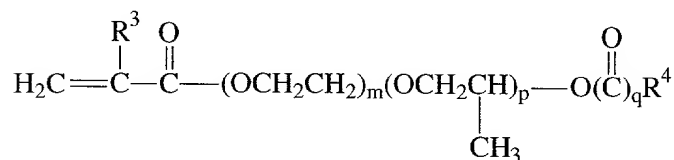
WHAT IS CLAIMED IS:

1. A water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkyl-Y-containing side chains, wherein Y is O or NR, wherein R is H or CH<sub>3</sub>, and wherein the alkyl group of the alkyl-Y-containing side chain has at least 4 carbon atoms on average in a cyclic, branched-, or straight-chain configuration and optionally includes one or more heteroatoms; an oil phase; and a water phase.
2. The water-in-oil emulsion of claim 1 wherein the vinyl polymer is soluble in the oil phase.
3. The water-in-oil emulsion of claim 1 wherein the ethylene oxide groups and alkyl-Y groups are in different side chains.
4. The water-in-oil emulsion of claim 1 which is stable.
5. The water-in-oil emulsion of claim 1 which is substantive.
6. The water-in-oil emulsion of claim 5 which provides a reduction in skin capacitance of greater than about 15%.
7. The water-in-oil emulsion of claim 1 wherein the ethylene oxide-containing side chains further include isopropylene oxide groups.
8. The water-in-oil emulsion of claim 1 wherein the ethylene oxide-containing side chains include at least four ethylene oxide groups.
9. The water-in-oil emulsion of claim 1 wherein the oil phase comprises one or more oils present in a total amount of at least about 20 wt-%, based on the total weight of the emulsion.

10. The water-in-oil emulsion of claim 1 wherein the ethylene oxide-containing side chains are derived from one or more monoethylenically unsaturated poly(alkylene oxide) (meth)acrylic monomers.

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11. The water-in-oil emulsion of claim 10 wherein the monoethylenically unsaturated poly(alkylene oxide) (meth)acrylic monomers have the formula:



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wherein:

m is at least 2;

p is 0 to 50;

q is 0 or 1;

R<sup>3</sup> is H or CH<sub>3</sub>; and

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R<sup>4</sup> is hydrogen or linear or branched alkyl and/or aryl groups;

with the proviso that the isopropylene oxide groups (the “p” groups) and the ethylene oxide groups (the “m” groups) are arranged in a reversed, alternating, random, or block configuration.

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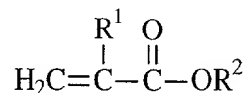
12. The water-in-oil emulsion of claim 1 wherein the alkyl-Y-containing side chains are derived from one or more monoethylenically unsaturated alkyl (meth)acrylic monomers.

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13. The water-in-oil emulsion of claim 12 wherein the monoethylenically unsaturated alkyl (meth)acrylic monomers are selected from the group consisting of (meth)acrylate monomers, (meth)acrylamide monomers, and combinations thereof.

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14. The water-in-oil emulsion of claim 12 wherein the monoethylenically unsaturated alkyl (meth)acrylic monomers are alkyl (meth)acrylate monomers having the formula:



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wherein:

R<sup>1</sup> is H or CH<sub>3</sub>; and

R<sup>2</sup> is a linear, branched, or cyclic alkyl group optionally including one or more heteroatoms.

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15. The water-in-oil emulsion of claim 1 further comprising a stabilizer.

16. The water-in-oil emulsion of claim 1 wherein the vinyl polymer is the reaction product of:

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about 60 wt-% to about 90 wt-% of at least one monoethylenically unsaturated alkyl (meth)acrylic monomer; and

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about 10 wt-% to about 40 wt-% of at least one monoethylenically unsaturated poly(alkylene oxide) (meth)acrylic monomer.

17. The water-in-oil emulsion of claim 1 which has compatibility with at least one bioactive agent.

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18. The water-in-oil emulsion of claim 17 wherein the bioactive agent is an antimicrobial.

19. The water-in-oil emulsion of claim 18 wherein the antimicrobial is chlorhexidine gluconate.

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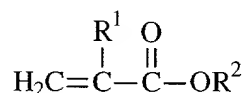
20. The water-in-oil emulsion of claim 18 wherein the antimicrobial is an iodophor.
- 5 21. The water-in-oil emulsion of claim 20 wherein the iodophor is povidone-iodine.
22. The water-in-oil emulsion of claim 1 wherein a pressure sensitive adhesive tape applied over the emulsion on skin adheres at a level of at least about 50% of the level of adhesion  
10 of the pressure sensitive adhesive tape applied directly to the skin.
23. The water-in-oil emulsion of claim 1 wherein the vinyl polymer has a calculated HLB of more than about 1 and less than about  
15 10.
24. The water-in-oil emulsion of claim 1 comprising at least about 0.25 wt-% of the vinyl polymer, based on the total weight of the emulsion.  
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25. The water-in-oil emulsion of claim 1 comprising no more than about 10 wt-% of the vinyl polymer, based on the total weight of the emulsion.
- 25 26. The water-in-oil emulsion of claim 1 further comprising a humectant.
27. The water-in-oil emulsion of claim 1 further comprising one or more additives selected from the group consisting of humectants,  
30 surfactants, conditioners, sunscreen agents, insect repellents, vitamins, herbal extracts, antiperspirant or deodorant agents, skin bleaching agents, skin coloring agents, hair bleaching agents, hair coloring agents, depilating agents, antidandruff agents,

antiacne agents, astringents, tensors, skin toning agents, glitter, pigments, dyes, bleaches, perfumes, fragrances, preservatives, antioxidants, waxes, film-forming polymers, propellants, buffers, organic suspending agents, inorganic suspending agents, organic thickening agents, inorganic thickening agents, plasticizers, herbal extracts, flavoring agents, corn, callus, or wart removers, and combinations thereof.

28. A water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkoxy-containing side chains, wherein the alkyl group of the alkoxy-containing side chain has 4 to 50 carbon atoms on average in a cyclic, branched-, or straight-chain configuration and optionally includes one or more heteroatoms; an oil phase; and a water phase.

29. A water-in-oil emulsion comprising: an oil phase; a water phase; and a vinyl polymer comprising the reaction product of monomers comprising:

about 60 wt-% to about 90 wt-% of at least one monoethylenically unsaturated alkyl (meth)acrylate monomer having the formula:

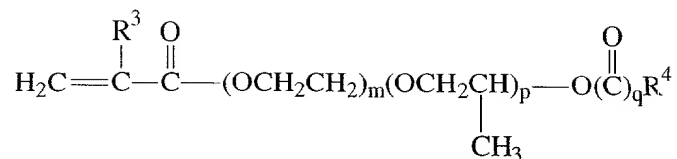


wherein:

$\text{R}^1$  is H or  $\text{CH}_3$ ; and

$\text{R}^2$  is a linear, branched, or cyclic alkyl group optionally including one or more heteroatoms; and

about 10 wt-% to about 40 wt-% of at least one monoethylenically unsaturated poly(alkylene oxide) (meth)acrylic monomer having the formula:



wherein:

m is at least 2;

p is 0 to 50;

q is 0 or 1;

R<sup>3</sup> is H or CH<sub>3</sub>; and

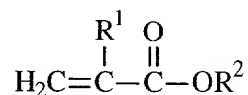
R<sup>4</sup> is hydrogen or linear or branched alkyl and/or aryl groups;

with the proviso that the isopropylene oxide groups (the “p” groups) and the ethylene oxide groups (the “m” groups) are arranged in a reversed, alternating, random, or block configuration;

with the proviso that the vinyl polymer includes no more than about 0.1 wt-% copolymerized acidic monomers.

30. The water-in-oil emulsion of claim 29 which is stable.
31. The water-in-oil emulsion of claim 29 which is substantive.
32. A moisturizing composition comprising a water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkyl-Y-containing side chains, wherein Y is O or NR, wherein R is H or CH<sub>3</sub>, and wherein the alkyl group of the alkyl-Y-containing side chain has at least 4 carbon atoms on average in a cyclic, branched-, or straight-chain configuration and optionally includes one or more heteroatoms; an oil phase; and a water phase.
33. The moisturizing composition of claim 32 which is stable.

34. The moisturizing composition of claim 32 which is substantive.
35. The moisturizing composition of claim 32 wherein a pressure sensitive adhesive tape applied over the emulsion on skin adheres at a level of at least about 50% of the level of adhesion of the pressure sensitive adhesive tape applied directly to the skin.
36. A moisturizing composition comprising a water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkoxy-containing side chains, wherein the alkyl group of the alkoxy-containing side chain has 4 to 50 carbon atoms on average in a cyclic, branched-, or straight-chain configuration and optionally includes one or more heteroatoms; an oil phase; and a water phase.
37. A moisturizing composition comprising a water-in-oil emulsion comprising: an oil phase; a water phase; and a vinyl polymer comprising the reaction product of monomers comprising:
- about 60 wt-% to about 90 wt-% of at least one monoethylenically unsaturated alkyl (meth)acrylate monomer having the formula:

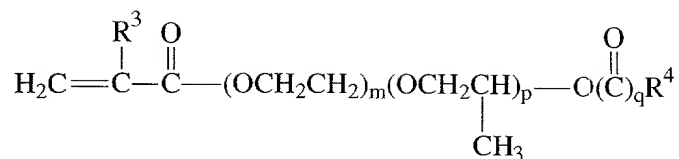


wherein:

$\text{R}^1$  is H or  $\text{CH}_3$ ; and

$\text{R}^2$  is a linear, branched, or cyclic alkyl group optionally including one or more heteroatoms; and

about 10 wt-% to about 40 wt-% of at least one monoethylenically unsaturated poly(alkylene oxide) (meth)acrylic monomer having the formula:



wherein:

m is at least 2;

p is 0 to 50;

q is 0 or 1;

R<sup>3</sup> is H or CH<sub>3</sub>; and

R<sup>4</sup> is hydrogen or linear or branched alkyl and/or aryl groups;

with the proviso that the isopropylene oxide groups (the “p” groups) and the ethylene oxide groups (the “m” groups) are arranged in a reversed, alternating, random, or block configuration.

38. A tissue antiseptic composition comprising a water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkyl-Y-containing side chains, wherein Y is O or NR, wherein R is H or CH<sub>3</sub>, and wherein the alkyl group of the alkyl-Y-containing side chain has at least 4 carbon atoms on average in a cyclic, branched-, or straight-chain configuration and optionally includes one or more heteroatoms; an oil phase; a water phase; and an antimicrobial.

39. The tissue antiseptic composition of claim 38 which is stable.

40. A tissue antiseptic composition comprising a water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkoxy-containing side chains, wherein the alkyl group of the alkoxy-containing side chain has 4



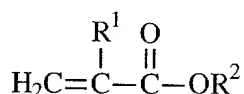


groups) are arranged in a reversed, alternating, random, or block configuration.

- 5 42. A personal care composition comprising a water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkyl-Y-containing side chains, wherein Y is O or NR, wherein R is H or CH<sub>3</sub>, and wherein the alkyl group of the alkyl-Y-containing side chain has at least 4 carbon atoms on average in a cyclic, branched-, or straight-chain configuration and optionally includes one or more heteroatoms; an oil phase; and a water phase.
- 10
- 15 43. The personal care composition of claim 42 which is a hair care composition.
44. The personal care composition of claim 43 wherein the hair care composition is a styling agent, shampoo, dye, conditioner, rinse, antidandruff preparation, or mask for the hair.
- 20 45. The personal care composition of claim 42 which is in the form of an insect repellant, shaving product, hand lotion, body lotion, gel, cream, sunless tanning composition, sunscreen, cleanser, toner, astringent, freshener, mask for skin, nail polish, nail strengthener, underarm deodorant, antiperspirant, bath powder, talc, bath oil, bubble bath, makeup, cologne, perfume, composition for cushioning sores, or hair removal composition.
- 25
- 30 46. The personal care composition of claim 42 which is a makeup.
47. The personal care composition of claim 46 wherein the makeup is a lipstick, eye shadow, eye liner, mascara, rouge, face powder, or foundation.

48. A personal care composition comprising a water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkoxy-containing side chains, wherein the alkyl group of the alkoxy-containing side chain has 4 to 50 carbon atoms on average in a cyclic, branched-, or straight-chain configuration and optionally includes one or more heteroatoms; an oil phase; and a water phase.

49. A personal care composition comprising a water-in-oil emulsion comprising: an oil phase; a water phase; and a vinyl polymer comprising the reaction product of monomers comprising:  
about 60 wt-% to about 90 wt-% of at least one monoethylenically unsaturated alkyl (meth)acrylate monomer having the formula:

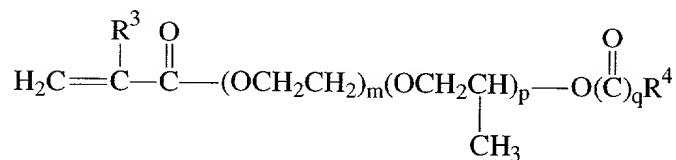


wherein:

R<sup>1</sup> is H or CH<sub>3</sub>; and

R<sup>2</sup> is a linear, branched, or cyclic alkyl group optionally including one or more heteroatoms; and

about 10 wt-% to about 40 wt-% of at least one monoethylenically unsaturated poly(alkylene oxide) (meth)acrylic monomer having the formula:



wherein:

m is at least 2;

p is 0 to 50;

q is 0 or 1;

R<sup>3</sup> is H or CH<sub>3</sub>; and

R<sup>4</sup> is hydrogen or linear or branched alkyl and/or aryl groups;

with the proviso that the isopropylene oxide groups (the “p” groups) and the ethylene oxide groups (the “m” groups) are arranged in a reversed, alternating, random, or block configuration.

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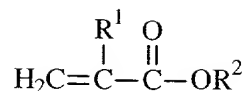
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50. A transdermal drug delivery composition comprising a water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkyl-Y-containing side chains, wherein Y is O or NR, wherein R is H or CH<sub>3</sub>, and wherein the alkyl group of the alkyl-Y-containing side chain has at least 4 carbon atoms on average in a cyclic, branched-, or straight-chain configuration and optionally includes one or more heteroatoms; an oil phase; a water phase; and a pharmaceutical agent.

51. A transdermal drug delivery composition comprising a water-in-oil emulsion comprising: a vinyl polymer comprising ethylene oxide-containing side chains and alkoxy-containing side chains, wherein the alkyl group of the alkoxy-containing side chain has 4 to 50 carbon atoms on average in a cyclic, branched-, or straight-chain configuration and optionally includes one or more heteroatoms; an oil phase; a water phase; and a pharmaceutical agent.

52. A transdermal drug delivery composition comprising a water-in-oil emulsion comprising: an oil phase; a water phase; a pharmaceutical agent; and a vinyl polymer comprising the reaction product of monomers comprising:  
about 60 wt-% to about 90 wt-% of at least one monoethylenically unsaturated alkyl (meth)acrylate monomer having the formula:



wherein:

R<sup>1</sup> is H or CH<sub>3</sub>; and

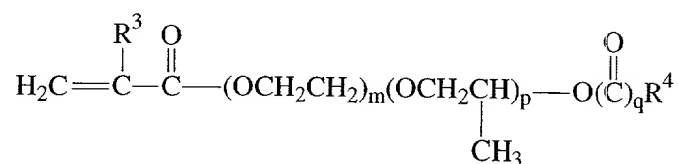
R<sup>2</sup> is a linear, branched, or cyclic alkyl group optionally

including one or more heteroatoms; and

about 10 wt-% to about 40 wt-% of at least one

monoethylenically unsaturated poly(alkylene oxide)

(meth)acrylic monomer having the formula:



wherein:

m is at least 2;

p is 0 to 50;

q is 0 or 1;

R<sup>3</sup> is H or CH<sub>3</sub>; and

R<sup>4</sup> is hydrogen or linear or branched alkyl and/or aryl groups;

with the proviso that the isopropylene oxide groups (the

“p” groups) and the ethylene oxide groups (the “m”

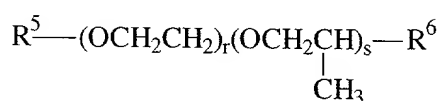
groups) are arranged in a reversed, alternating, random,

or block configuration.

53. A method of moisturizing mammalian skin comprising applying a moisturizing composition of claim 32 to mammalian skin.

54. A method of moisturizing mammalian skin comprising applying a moisturizing composition of claim 36 to mammalian skin.

55. A method of moisturizing mammalian skin comprising applying a moisturizing composition of claim 37 to mammalian skin.
56. A method of disinfecting mammalian tissue comprising applying a tissue antiseptic composition of claim 38 to mammalian tissue.
57. A method of disinfecting mammalian tissue comprising applying a tissue antiseptic composition of claim 40 to mammalian tissue.
58. A method of disinfecting mammalian tissue comprising applying a tissue antiseptic composition of claim 41 to mammalian tissue.
59. A method of delivering a pharmaceutical agent to a mammal comprising applying a transdermal drug delivery composition of claim 50 to mammalian skin.
60. A method of delivering a pharmaceutical agent to a mammal comprising applying a transdermal drug delivery composition of claim 51 to mammalian skin.
61. A method of delivering a pharmaceutical agent to a mammal comprising applying a transdermal drug delivery composition of claim 52 to mammalian skin.
62. A composition comprising a water-in-oil emulsion having a pH of about 3 to about 5 and comprising a polyetherpolyester emulsifying polymer; a water phase; and an oil phase; wherein the polyetherpolyester emulsifying polymer has the following structure:



wherein:

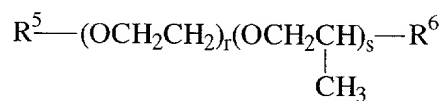
r is 10 to 200;

s is 0 to 150;

R<sup>5</sup> and R<sup>6</sup> are independently selected from polyester  
polymers or oligomers formed by the condensation  
polymerization of C<sub>8</sub>-C<sub>22</sub> hydroxyalkyl acids wherein the  
polyester has at least 3 repeating groups on average; with  
the proviso that the isopropylene oxide groups (the “s”  
groups) and the ethylene oxide groups (the “r” groups)  
are arranged in a reversed, alternating, random, or block  
configuration.

63. The composition of claim 62 wherein the polyetherpolyester  
polymer is a polyethylene oxide terminated in polyhydroxy  
stearate.

64. A tissue antiseptic composition comprising a water-in-oil  
emulsion comprising a polyetherpolyester emulsifying polymer;  
a water phase; an oil phase; and an antimicrobial; wherein the  
polyetherpolyester emulsifying polymer has the following  
structure:



wherein:

r is 10 to 200;

s is 0 to 150;

R<sup>5</sup> and R<sup>6</sup> are independently selected from polyester  
polymers or oligomers formed by the condensation  
polymerization of C<sub>8</sub>-C<sub>22</sub> hydroxyalkyl acids wherein the  
polyester has at least 3 repeating groups on average;  
with the proviso that the isopropylene oxide groups (the  
“s” groups) and the ethylene oxide groups (the “r”

groups) are arranged in a reversed, alternating, random, or block configuration.

- 5      65.      A method of disinfecting mammalian tissue comprising applying a tissue antiseptic composition of claim 64 to mammalian tissue.